

Update on Mid-Point Assessment STAC Reviews

Bill Ball, STAC Executive Secretary

June 7, 2016

STAC Quarterly Meeting

Annapolis, Maryland

CBP Sponsor**Topic****Timeframe****1****3****2**

CBP Sponsor	Topic	Timeframe
Water Quality Goal Implementation Team (WQGIT)	Corps of Engineer's Draft Lower Susquehanna River Watershed Assessment Report	Completed
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1

Ambient Water Quality Criteria Addendum for Dissolved Oxygen, Water Clarity & Chlorophyll-a for the Chesapeake Bay and Its Tidal Tributaries (WQC Addendum)

STAC Review Panel

Marjy Friedrichs	Virginia Institute of Marine Science
Mary Christman	MCC Statistical Consulting & Univ. Florida
Ken Moore	Virginia Institute of Marine Science
Malcolm Scully	Woods Hole Oceanic Institute
Jian Shen	Virginia Institute of Marine Science
Steve Weisberg	SCCWRP (Southern California Coastal Water Research Project)
Bill Ball	Chesapeake Research Consortium
Natalie Gardner	Chesapeake Research Consortium

1

WQC Addendum Review

Status: On-going

Feb. 12: Webinar briefing with CBP and review panel

Mar. 11: Initial review panel call

Panel requested re-write for additional clarification

Apr. 27: Revised document received

May 12: Review panel call to discuss revised documents

May 12-present: Discussions with CBP about next steps; now back in CBP court

In short: The panel suggested a clarifying re-write & then was not satisfied with the revisions. Panel proposed two options:

(1) finalize review with current document or

(2) Give CBP opportunity for serious revision and make final review later

Review panel will work with CBP to produce a new and improved document incorporating the panels comments.

2

Nutrient Inputs to the Chesapeake Bay Watershed Model (Scenario Builder)

Status: Pending STAC approval (documents and questions out)

Apr. 15: Call with CBP to discuss draft review questions

May 6: Call with Yagow, Ball, & Gardner to discuss possible panelists, timeline, etc.

May 12: STAC staff requested CBP to provide formal request for STAC to approve

May 25: Invitation sent to review panel

Waiting for the CBP Modeling Workgroup to send formal request. Once received, Gardner will distribute official request to STAC for approval.

Meanwhile..... Preview of questions today

2

Nutrient Inputs to Chesapeake Bay Watershed Model: Review Questions

- (1) Overall appropriateness of methods used to estimate total manure and fertilizer available for application
- (2) Overall appropriateness of methods used to distribute-applications to crops, hay and pasture.
- (3) Overall appropriateness of the method used to estimate double-cropped acres.
- (4) Overall appropriateness of the agricultural forecasting method.
- (5) Does the documentation sufficiently describe the data and methods used?
- (6) Concerns or comments aside from those already listed above?
- (7) Additional technical data or scientific findings that could be employed?

2

Nutrient Inputs to the CBWM: First 3 Review Questions:

- (1) Given the state of available manure and fertilizer data, please comment on the overall appropriateness of the methods used to estimate total manure and fertilizer available for application to agricultural lands.
- (2) Understanding that farmer-reported nutrient application rates are not available for the majority of agricultural acres throughout the calibration period (1984-2013), please comment on the overall appropriateness of the methods used to distribute-applications to crops, hay and pasture.
- (3) Given the lack of data available to estimate acres on which two crops were harvested (double-cropped acres), please comment on the overall appropriateness of the method used to estimate these acres.

2

Nutrient Inputs to the CBWM: Last 4 Review Questions:

- (4) Considering the current state of the science related to agricultural forecasting and agricultural economics, please comment on the overall appropriateness of the agricultural forecasting method. Are there alternative forecasting methods you would recommend?
- (5) Does the documentation sufficiently describe the data and methods used to estimate nutrient inputs for the Watershed Model? Please expand if there are particular sections that should be expanded upon or improved.
- (6) Do the reviewers have any concerns or comments about the data or methods described within the documentation aside from those already listed above?
- (7) Are there additional technical data or scientific findings that could be employed by the Chesapeake Bay Program now, or developed in the future, to better inform nutrient input estimates across the watershed?

2

Nutrient Inputs to the CBWM:

STAC Review Panel

Gene Yagow	Virginia Tech
Marc Ribaud	USDA-Economic Research Service
Tamie Veith	USDA-Agricultural Research Service
Wade Thomason	Virginia Tech
Beth McGee	Chesapeake Bay Foundation

Missing expertise?

3

James River Chlorophyll-a Criteria Re-evaluation

Status: Pending STAC approval (documents and questions out)

May 20: Request received (including questions, background documentation, formal request)

Expertise Needs:

- The dynamics of estuarine phytoplankton and food web dynamics and responses to changes in water quality conditions characteristic of Chesapeake Bay
- Spatial statistics
- Application of water quality criteria in a TMDL context.

3

Review Questions:

1. Please comment on the scientific bases for applying a combined probability approach to derive expected frequencies of threshold exceedance as a function of mean chlorophyll a to determine whether attainment of these criteria would result in low rates of threshold exceedance.
2. Please comment on the approach's focus on the harmful effects of algae to derive chlorophyll criteria, rather than using reference conditions (as described in Buchanan, 2016) as an additional line of evidence.
3. Please comment on the approach for defining categories of threshold exceedances as 'protective', 'defensible', and 'not protective' and then applying them to make the determination as to whether the existing Virginia chlorophyll a criteria are protective of the aquatic life designated use and scientifically defensible. Please comment on the following findings: "The results of the effects-based analysis suggest that the current criteria are defensible in that they fall below the non-protective range. In most cases, the criteria fall above the upper threshold for low risk indicating that lowering the values of the criteria may result in further improvements in water quality and phytoplankton condition. However in most cases, anticipated reductions in frequency of exceedance at attainment of the low risk threshold were small."
4. Please comment on the finding that "the criteria were found to be less protective when interpreted as geometric means, indicating that conclusions regarding protectiveness are somewhat sensitive to the methodology by which attainment of the criteria is determined."
5. Please comment on the scientific basis for replacing the current chlorophyll a criteria attainment assessment procedures with the proposed alternative current chlorophyll a criteria attainment assessment procedures.
6. Please comment on whether the scientific basis and procedures described within the Scientific Advisory Panel's report could be used to derive new chlorophyll a criteria for application to other tidal habitats within Chesapeake Bay with the same salinity regimes and provide similar levels of protection of aquatic life.

3

James River Chlorophyll-a Criteria Re-evaluation: Review Questions

- (1) Comment on scientific bases for applying a combined probability approach to derive expected frequencies of threshold exceedance
- (2) Comment on the approach's focus on the harmful effects of algae to derive chlorophyll criteria, rather than using reference conditions
- (3) Comment on the approach for defining categories of threshold exceedances as 'protective', 'defensible', and 'not protective'
- (4) Comment on the findings that: "The results of the effects-based analysis suggest that the current criteria are defensible in that they fall below the non-protective range.
- (5) Comment on the finding that "the criteria were found to be less protective when interpreted as geometric means, ..."
- (6) Comment on the scientific basis for replacing the current chlorophyll *a* criteria attainment assessment procedures with the proposed alternative.
- (7) Comment on whether the scientific basis and procedures described within the Scientific Advisory Panel's report could be used to derive new chlorophyll *a* criteria for application to other tidal habitats

3 James River Chlorophyll-a Criteria Re-evaluation: First 3 Review Questions

1. Please comment on the scientific bases for applying a combined probability approach to derive expected frequencies of threshold exceedance as a function of mean chlorophyll *a* to determine whether attainment of these criteria would result in low rates of threshold exceedance.
2. Please comment on the approach's focus on the harmful effects of algae to derive chlorophyll criteria, rather than using reference conditions (as described in Buchanan, 2016) as an additional line of evidence.
3. Please comment on the approach for defining categories of threshold exceedances as 'protective', 'defensible', and 'not protective' and then applying them to make the determination as to whether the existing Virginia chlorophyll *a* criteria are protective of the aquatic life designated use and scientifically defensible.

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James River Chlorophyll-a Criteria Re-evaluation: Middle 2 Questions

4. Please comment on the following findings: “The results of the effects-based analysis suggest that the current criteria are defensible in that they fall below the non-protective range. In most cases, the criteria fall above the upper threshold for low risk indicating that lowering the values of the criteria may result in further improvements in water quality and phytoplankton condition. However in most cases, anticipated reductions in frequency of exceedance at attainment of the low risk threshold were small.”
5. Please comment on the finding that “the criteria were found to be less protective when interpreted as geometric means, indicating that conclusions regarding protectiveness are somewhat sensitive to the methodology by which attainment of the criteria is determined.”

3 James River Chlorophyll-a Criteria Re-evaluation: Last 2 Questions

6. Please comment on the scientific basis for replacing the current chlorophyll *a* criteria attainment assessment procedures with the proposed alternative current chlorophyll *a* criteria attainment assessment procedures.
7. Please comment on whether the scientific basis and procedures described within the Scientific Advisory Panel's report could be used to derive new chlorophyll *a* criteria for application to other tidal habitats within Chesapeake Bay with the same salinity regimes and provide similar levels of protection of aquatic life.

3

James River Chlorophyll-a Criteria Re-evaluation

Thoughts on review panel or expertise needs? STAC volunteers?

<u>Potential Reviewer</u>	<u>Affiliation</u>	<u>Relevant Expertise</u>
Lindsay Tempinson	UMCES	water quality indicators
Mark Brush	VIMS	plankton/modeler
Jian Shen	VIMS	numerical modeling/modeling simulations
Gamble (Mac) Sisson	VIMS	
Claire Buchanan	ICPRB	aquatic habitats
Donna Bilkovic	VIMS	marine ecologist/near-shore habitats
Larry Harding	UCLA	phytoplankton physiology and ecology
Tom Fisher	UMCES-HPL	nutrient cycling, primary production
Chuck Gallegos	SERC	Phytoplankton ecology
Lora Harris	UMCES-CBL	Systems ecology, phytoplankton
Raphael Kudela	USCS	phytoplankton ecology; growth & dist'n
Martha Sutula	SCCWRP	Eutrophication, HABs
Hans Paerl	UNC	microbially-mediated nutrient cycling; primary production
Jim Hagy	EPA	Hypoxia; water quality modeling
Suzanne Bricker	NOAA	Eutrophication; nutrient processing

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3

2

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